



## A.D.M. COLLEGE FOR WOMEN

(Autonomous)

*Affiliated to Bharathidasan University*

(Nationally Accredited with "A" Grade by NAAC – 4<sup>th</sup> Cycle)

NAGAPATTINAM 611 001.

### LOCAL/NATIONAL/REGIONAL/GLOBAL RELEVANCE

### PG AND RESEARCH DEPARTMENT OF MATHEMATICS

Programme: B.Sc Mathematics

Year: 2022-2023

Course Code	Title of the Course	Local/Regional/ National /Global	Rationale	Course Outcomes	PSOs Addressed	Cognitive Level
MUA	Differential Calculus and Trigonometry	Local , Regional, National & Global	Application of mathematics in various disciplines	<ul style="list-style-type: none"> <li>CO1:Apply Leibnitz's Theorem for finding the <math>n^{\text{th}}</math> derivative of product of functions.</li> </ul>	PSO2,3,4	U
				<ul style="list-style-type: none"> <li>CO2: Evaluate envelopes and curvatures of plane curves.</li> </ul>	PSO1,2,3,4	AP

				<ul style="list-style-type: none"> <li>• CO 3: Compute maxima and minima of plane curves..</li> </ul>	PS01,2,3,4	U
				<ul style="list-style-type: none"> <li>• CO 4: Interpret the relation between circular and hyperbolic functions</li> </ul>	PS01,2,3,4	U
				<ul style="list-style-type: none"> <li>• CO 5: Find the sum of infinite series using appropriate methods</li> </ul>	PS01,2,3,4	U
MUB	Classical Algebra	Local , Regional, National & Global	To get more depth in basic topics	<ul style="list-style-type: none"> <li>• CO 1: Understand the aspects of classical algebraic structures</li> </ul>	PS02	U,KN

				<ul style="list-style-type: none"> <li>• CO 2: Find the nature of the roots of the equations</li> </ul>	PSO3	KN,AN,E
				<ul style="list-style-type: none"> <li>• CO3: Solve and apply the inequalities.</li> </ul>	PSO3	E,AN,AP
				<ul style="list-style-type: none"> <li>• CO 4: Find the inverse and rank of the matrix</li> </ul>	PSO2,3	E,AP
				<ul style="list-style-type: none"> <li>• CO5: Calculate the Eigen values and vectors of a matrix and apply the C-H theorem for finding the inverse of a matrix</li> </ul>	PSO2,3,4	E,AP
MUC	Integral Calculus	Local , Regional, National & Global	Application of mathematics in chemistry is inculcated.	<ul style="list-style-type: none"> <li>• CO1: Find the solutions of the integral.</li> </ul>	PSO2,3	CN,E

				<ul style="list-style-type: none"> <li>• CO2: Solve the integration by parts.</li> </ul>	PSO2,3	E
				<ul style="list-style-type: none"> <li>• CO3: Find the area of plane curves using Cartesian and polar coordinates</li> </ul>	PSO2,3,1,5	KN,E
				<ul style="list-style-type: none"> <li>• CO4: Find the area by changing the given order of integration</li> </ul>	PSO 2,3	U,KN,E
				<ul style="list-style-type: none"> <li>• CO5: understand the concepts of Beta and Gamma functions</li> </ul>	PSO 2,3	U,KN,E
MUD	Analytical Geometry of Three Dimensions	Local , Regional, National & Global	Better application knowledge	<ul style="list-style-type: none"> <li>• CO 1: understand the three dimensional space, angle between lines and planes.</li> </ul>	PSO1,3,4,5	U
				<ul style="list-style-type: none"> <li>• CO2: Find the coplanar lines, skew lines and to find shortest distance between them.</li> </ul>	PSO1,3,4,5	AP

				<ul style="list-style-type: none"> <li>• CO 3: Formulate the equation of sphere and their properties.</li> </ul>	PSO1,3,4,5	AP
				<ul style="list-style-type: none"> <li>• CO 4: Form the equation of cone with a conic as guiding curve and the tangent lines.</li> </ul>	PSO1,3,4,5	AP
				<ul style="list-style-type: none"> <li>• CO 5: retrieve the equation of cylinder and right circular cylinder.</li> </ul>	PSO1,3,4,5	AP
MUE	Differential Equations and Laplace Transforms	Local , Regional, National & Global	Application of Differential equations and Laplace transforms are vast.	<ul style="list-style-type: none"> <li>• CO 1: Solve the higher order linear differential equations with constant coefficients.</li> </ul>	PSO2,3,4	KN,EN
				<ul style="list-style-type: none"> <li>• CO 2: Solve differential equations by using</li> </ul>	PSO2,3,4	CN,EN

				method of variation of parameters		
				<ul style="list-style-type: none"> <li>• CO 3: Find solutions of first order partial differential equations of the standard forms</li> </ul>	PSO3,5	KN,CN,EN
				<ul style="list-style-type: none"> <li>• CO 4: Solve the PDE's using Charpit's method.</li> </ul>	PSO1,3	U,KN,EN
				<ul style="list-style-type: none"> <li>• CO 5: apply the techniques of Laplace transform and inverse Laplace transform</li> </ul>	PSO2,3,4	U,CN,KN,EN
MUF	Vector Calculus and Fourier Series	Local , Regional, National & Global	To get more depth in basic Mathematical concepts.	<ul style="list-style-type: none"> <li>• CO 1: Explain the concepts of differentiation of vector field.</li> </ul>	PSO1,3,4	U,C,KN

				<ul style="list-style-type: none"> <li>CO 2: Integrate the vector functions over curves and surfaces.</li> </ul>	PSO1,2,3,4	U,E
				<ul style="list-style-type: none"> <li>CO 3: Compute integrals using Green's theorem, Stoke's theorem and the divergence theorem.</li> </ul>	PSO1,2,3,4	U,E,AP
				<ul style="list-style-type: none"> <li>CO4: Solve the wave equations, Laplace equations using Fourier series</li> </ul>	PSO1,2,3,5	U,E,AP
				<ul style="list-style-type: none"> <li>CO5: Derive the fourier series to the periodic signals in half range.</li> </ul>	PSO1,2,3,5	U,E,AP

MUG	Sequences and Series	Local , Regional, National & Global	To meet the current requirements and concentrate more on application oriented problems	<ul style="list-style-type: none"> <li>• CO 1: Find the convergence of sequences</li> </ul>	PSO4	U,E
				<ul style="list-style-type: none"> <li>• CO 2: Evaluate the limits and describe the behavior of monotonic sequences</li> </ul>	PSO1,2,3,4	U,E,CN
				<ul style="list-style-type: none"> <li>• CO 3: Interpret the concepts of subsequences and Cauchy sequences.</li> </ul>	PSO1,2,3,4	U,CN,KN
				<ul style="list-style-type: none"> <li>• CO 4: Discuss the convergence or divergence of series using various tests</li> </ul>	PSO1,2,3,5	U,AN
				<ul style="list-style-type: none"> <li>• CO 5: Compute the absolute convergence of series.</li> </ul>	PSO1,2,3,5	KN,E



MUH	Number Theory	Local , Regional, National & Global	To highlight the nuances in the world of numbers	<ul style="list-style-type: none"> <li>• CO 1: Find the divisor, sum and product of a given natural number</li> </ul>	PSO2,3,4	CN,EN
				<ul style="list-style-type: none"> <li>• CO 2: Gain the knowledge of number theoretic functions</li> </ul>	PSO3,4	KN,AN
				<ul style="list-style-type: none"> <li>• CO 3: Interpret the famous conjectures in number theory</li> </ul>	PSO2,3,4	CN,AN
				<ul style="list-style-type: none"> <li>• CO 4: Solve the system of linear congruence using the Chinese remainder theorem.</li> </ul>	PSO1,2,3,4	CN,EN
				<ul style="list-style-type: none"> <li>• CO 5: Apply the law of quadratic reciprocity to classify numbers as quadratic residues &amp; quadratic non-residues</li> </ul>	PSO1,2,3,4	AN,AP,EN

MUI	Algebra	Local , Regional, National & Global	To get Knowledge of pure mathematics	<ul style="list-style-type: none"> <li>• CO1:Gain the knowledge of sets, mapping, relations, groups and subgroups.</li> </ul>	PSO2,4,5	U,KN
				<ul style="list-style-type: none"> <li>• CO2:Interpret the notion of normal groups and isomorphism.</li> </ul>	PSO2,4	U,C
				<ul style="list-style-type: none"> <li>• CO 3: Analyze the concepts of homomorphism and isomorphism for rings and field.</li> </ul>	PSO2,4	U,AN
				<ul style="list-style-type: none"> <li>• CO 4: Recognize the facts of vector space and linear independence.</li> </ul>	PSO1,2,3,4	U,C
				<ul style="list-style-type: none"> <li>• CO 5: Calculate the basis, dimension, matrix of the linear</li> </ul>	PSO2,4	U,E

				transformation and inner product space		
MUJ	Real Analysis	Local , Regional, National & Global	To get more depth in basic topics.	<ul style="list-style-type: none"> <li>• CO1: Gain the knowledge of sets, mapping, relations, groups and subgroups.</li> </ul>	PSO2,4,5	U,KN
				<ul style="list-style-type: none"> <li>• CO2: Interpret the notion of normal groups and isomorphism.</li> </ul>	PSO2,4	U,C
				<ul style="list-style-type: none"> <li>• CO3: Analyze the concepts of homomorphism and isomorphism for rings and field.</li> </ul>	PSO2,4	U,AN
				<ul style="list-style-type: none"> <li>• CO4: Recognize the facts of vector space and linear independence.</li> </ul>	PSO1,2,3,4	U,C

				CO5: calculate the basis, dimension, matrix of the linear transformation and inner product space	PSO2,4	U,E
MUK	Mechanics	Local , Regional, National & Global	More preference is given for pure mathematics	• CO 1: Apply the order completeness property.	PSO2,3,4	AN,KN
				• CO 2: Differentiate the continuity and discontinuity of functions.	PSO1,2,3,4,5	E,AN,AP
				• CO 3: Find the derivative of a given function.	PSO 1,3,4,5	E,AN,AP
				• CO 4: Demonstrate the mean value theorems.	PSO1,2,3,4	E,AN,AP,KN
				• CO 5: I interpret the integer ability of functions	PSO1,3,4,5	E,AN,AP,KN,C

MUE3	Operations Research	Local , Regional, National & Global	Latest reference needed for higher level concepts.	<ul style="list-style-type: none"> <li>• CO 1: Apply the order completeness property.</li> </ul>	PSO3,5	UN,KN
				<ul style="list-style-type: none"> <li>• CO 2: differentiate the continuity and discontinuity of functions.</li> </ul>	PSO1,2,3,4	KN, CN
				<ul style="list-style-type: none"> <li>• CO 3: Find the derivative of a given function.</li> </ul>	PSO 3,4	KN, CN
				<ul style="list-style-type: none"> <li>• CO 4: Demonstrate the mean value theorems.</li> </ul>	PSO2,3	CN,EN,AN
				<ul style="list-style-type: none"> <li>• CO 5: Interpret the integrality of functions</li> </ul>	PSO1,2,3,4	CN,AN
MUL	Complex Analysis	Local , Regional, National & Global	To get the Knowledge of Analysis.	<ul style="list-style-type: none"> <li>• CO 1: Understand the basic concepts of Cauchy-Riemann equations in Cartesian and polar coordinates.</li> </ul>	PSO2,3,4	AN,E,KN,AP

				<ul style="list-style-type: none"> <li>CO 2: Interpret the analytic functions, harmonic functions, elementary and bilinear transformation concepts.</li> </ul>	PS02,3,4	AN,E,KN,AP
				<ul style="list-style-type: none"> <li>CO 3: Apply the theorems using complex integration.</li> </ul>	PS01,2,3,4,5	AP,AN,E
				<ul style="list-style-type: none"> <li>CO 4: Expand the Taylor's and Laurent's series of functions.</li> </ul>	PS01,2,3,4,5	AN,AP,E,KN
				<ul style="list-style-type: none"> <li>CO 5: solve the definite integrals using the concepts of residues.</li> </ul>	PS01,2,3,4	E,AN,AP,KN

MUM & MUNY	Numerical Methods with C Programming (Theory & P)	Local , Regional, National & Global	For efficient project task completion and data analysis	<ul style="list-style-type: none"> <li>• CO 1: Find the variables, constants, expressions and operators.</li> </ul>	PSO2,4,5	U,KN
				<ul style="list-style-type: none"> <li>• CO 2: Use functions and arrays.</li> </ul>	PSO2	U,KN
				<ul style="list-style-type: none"> <li>• CO 3: Write the programmes on arithmetic operations and recursion.</li> </ul>	PSO2,5	U,AP,KN
				<ul style="list-style-type: none"> <li>• CO 4: Evaluate the linear equations and matrices numerically.</li> </ul>	PSO2	U,AP
				<ul style="list-style-type: none"> <li>• CO 5: Solve simultaneous system of equations using numerical techniques.</li> </ul>	PSO2	U,AP

MUO	Astronomy	Local , Regional, National & Global	To know about the celestial objects.	<ul style="list-style-type: none"> <li>• CO1: Perform calculations on celestial bodies.</li> </ul>	PSO1,3,4	U
				<ul style="list-style-type: none"> <li>• CO 2: Compare our galaxy with other galaxies.</li> </ul>	PSO1,3,4	U
				<ul style="list-style-type: none"> <li>• CO 3: apply the principles and fundamental techniques of the astronomy.</li> </ul>	PSO1,5	AP
				<ul style="list-style-type: none"> <li>• CO 4: Analyze the size, age structure and motion of the universe over all using cosmological models.</li> </ul>	PSO1,3,4	AN



				<ul style="list-style-type: none"> <li>CO 5: Understand the phases of moon and occurrence of Eclipses.</li> </ul>	PSO1,3,4	U
MUE4	Stochastic Processes	Local , Regional, National & Global	To know about real world applications	<ul style="list-style-type: none"> <li>CO 1: Analyze and solve linear programming models of real life situations</li> </ul>	PSO2,3	CN,EN
				<ul style="list-style-type: none"> <li>CO 2: Understand the problem solving method of Simplex and Big M Method.</li> </ul>	PSO2,3	EN
				<ul style="list-style-type: none"> <li>CO 3: Exhibit the applications of Transportation Problem.</li> </ul>	PSO2,3,1,5	KN,EN

				<ul style="list-style-type: none"> <li>• CO 4: Solve Assignment problems.</li> </ul>	PSO2,3	U,KN,EN
				<ul style="list-style-type: none"> <li>• CO 5: Use PERT and CPM techniques in solving Network Analysis problems</li> </ul>	PSO2,3	U,KN,EN
MUE5	Graph Theory	Local , Regional, National & Global	To emphasize its applications.	<ul style="list-style-type: none"> <li>• CO 1: Understand the basic concepts of Formal Languages.</li> </ul>	PSO 2	KN,AN
				<ul style="list-style-type: none"> <li>• CO 2: Permutations and Combinations.</li> </ul>	PSO1	KN,AN
				<ul style="list-style-type: none"> <li>• CO 3: Acquire knowledge about Finite State Machines</li> </ul>	PSO4	AN,AP
				<ul style="list-style-type: none"> <li>• CO4: Understand Numeric Functions</li> </ul>	PSO4	AN,AP
				<ul style="list-style-type: none"> <li>• CO5: Understand Recurrence Relations.</li> </ul>	PSO1	AN,E



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### LOCAL/NATIONAL/REGIONAL/GLOBAL RELEVANCE PG AND RESEARCH DEPARTMENT OF MATHEMATICS

Programme: M.Sc., Mathematics

Year: 2022-2023

Course Code	Title of the Course	Local/Regional/ National /Global	Rationale	Course Outcomes	PSOs Addressed	Cognitive Level
PGMA	Algebra	Local , Regional, National & Global	Standard knowledge of algebra for global scenario	<ul style="list-style-type: none"> <li>CO1:Understand Sylow's theorem and its applications.</li> </ul>	PSO2	An
				<ul style="list-style-type: none"> <li>CO2:Analyze the various types of polynomials.</li> </ul>	PSO1	An

				<ul style="list-style-type: none"> <li>• CO3:Develop the knowledge about modules.</li> </ul>	PSO2	Ap
				<ul style="list-style-type: none"> <li>• CO4:Evaluate the roots and characteristics of polynomials.</li> </ul>	PSO1	An
				<ul style="list-style-type: none"> <li>• CO5:Apply finite fields in Galois Theory</li> </ul>	PSO1 PSO2	An & Ap
GMB	Real Analysis	Local , Regional, National & Global	To get the Knowledge of Analysis.	<ul style="list-style-type: none"> <li>• CO1:Acquire the basic topological properties on metric spaces.</li> </ul>	PSO1	U

				<ul style="list-style-type: none"> <li>• CO2: Interpret the continuity and discontinuity of functions.</li> </ul>	PSO1	U
				<ul style="list-style-type: none"> <li>• CO3: Analyze the Riemann - Stieltjes integral and their properties.</li> </ul>	PSO1	AN
				<ul style="list-style-type: none"> <li>• CO4: Develop the knowledge of sequence and series of functions.</li> </ul>	PSO1	U
				<ul style="list-style-type: none"> <li>• CO5: Understand functions of several variables.</li> </ul>	PSO1	AN
PGMC	Ordinary Differential Equations	Local , Regional, National & Global	Latest reference needed for higher level concepts	<ul style="list-style-type: none"> <li>• CO1: Obtain the solutions of ordinary differential equations..</li> <li>•</li> </ul>	PSO1	U

				<ul style="list-style-type: none"> <li>• CO2: Evaluate the special functions.</li> </ul>	PSO2	AP
				<ul style="list-style-type: none"> <li>• CO3: Analyze the behavior of the solutions of the ODE.</li> </ul>	PSO1 PSO2	AP
				<ul style="list-style-type: none"> <li>• CO4: Discuss the properties of boundary value problems.</li> </ul>	PSO1,2,4	AP
				<ul style="list-style-type: none"> <li>• CO5: Solve the system of nonlinear equations.</li> </ul>	PSO1,4	AP
PGMD	Advanced Graph Theory	Local , Regional, National & Global	Application Oriented topics were added	<ul style="list-style-type: none"> <li>• CO1: Analyze the automorphism and operations on graphs.</li> </ul>	PSO1	U
				<ul style="list-style-type: none"> <li>• CO2: Discuss the characterization, centers and centroids of trees.</li> </ul>	PSO1	U

				<ul style="list-style-type: none"> <li>• CO3:Find the independent sets and matchings of graphs, Eulerian and Hamiltonian graphs.</li> </ul>	PSO1,2	U,AN
				<ul style="list-style-type: none"> <li>• CO4:Color the graphs and find the chromatic polynomial.</li> </ul>	PSO1,4	AP
				<ul style="list-style-type: none"> <li>• CO5:Interpret the planar and non-planar graphs.</li> </ul>	PSO1,2	AP
PGME1	Advanced Numerical Analysis	Local , Regional, National & Global	Latest reference needed for higher level concepts	<ul style="list-style-type: none"> <li>• CO1:Solve transcendental and polynomial equations</li> </ul>	PSO1	U
				<ul style="list-style-type: none"> <li>• CO2:Determine the solution of linear equations.</li> </ul>	PSO1	AP
				<ul style="list-style-type: none"> <li>• CO3:Evaluate the higher order</li> </ul>	PSO1,4	AP

				interpolation.		
				<ul style="list-style-type: none"> <li>CO4:Estimate the numerical differentiation and integration.</li> </ul>	PSO1	U
				<ul style="list-style-type: none"> <li>CO5:Interpret the methods of solving integration numerically.</li> </ul>	PSO1,3	AP
PGMG	Partial Differential Equations	Local , Regional, National & Global	To know about higher level of solving method and its application in Heat, Wave Equation.	<ul style="list-style-type: none"> <li>CO1:Classify the PDE.</li> </ul>	PSO1	U
				<ul style="list-style-type: none"> <li>CO2:Apply Charpit's and Jacobi's method for solving PDE.</li> </ul>	PSO1	U
				<ul style="list-style-type: none"> <li>CO3:Solve second order and higher order PDE.</li> </ul>	PSO1	U
				<ul style="list-style-type: none"> <li>CO4:Evaluate non Linear equations of the second order.</li> </ul>	PSO1,4	AP



				<ul style="list-style-type: none"> <li>• CO5: Compute boundary value problems.</li> </ul>	PSO1,3	AP
PGMH	Classical Dynamics	Local , Regional, National & Global	To get the knowledge about mathematical concepts in Classical version.	<ul style="list-style-type: none"> <li>• CO1: Analyze the mechanical system of particles.</li> </ul>	PSO1	AN
				<ul style="list-style-type: none"> <li>• CO2: Solve the Lagrange's equations of motion for the set of generalized coordinates.</li> </ul>	PSO1	U
				<ul style="list-style-type: none"> <li>• CO3: Apply Lagrange's equations on various functions.</li> </ul>	PSO1	AP
				<ul style="list-style-type: none"> <li>• CO4: Interpret Hamilton's equations and its principles.</li> </ul>	PSO2	U

				<ul style="list-style-type: none"> <li>• CO5:Retrieve Hamilton – Jacobi Equation.</li> </ul>	PSO1	AP
PGME2	Fuzzy sets and its Applications	Local , Regional, National & Global	Recent Trend of Knowledge	<ul style="list-style-type: none"> <li>• CO1: Discuss the properties and extension principles of fuzzy sets.</li> </ul>	PSO1,2,3,4,5	KN,CN
				<ul style="list-style-type: none"> <li>• CO2: Apply the mathematical operations on fuzzy sets.</li> </ul>	PSO1,3,4	KN,EN
				<ul style="list-style-type: none"> <li>• CO3:Construct the arithmetic operations on fuzzy numbers.</li> </ul>	PSO1,4	CN,EN
				<ul style="list-style-type: none"> <li>• CO4: Interpret the relations on fuzzy sets.</li> </ul>	PSO1,2,3,4	KN,AN
				<ul style="list-style-type: none"> <li>• CO5: Analyze fuzzy concepts in decision making</li> </ul>	PSO2,3,4	AN,EN

				problems.		
PGMI	Measure and Integration	Local , Regional, National & Global	To get the Knowledge about concepts of Integration using Measures.	<ul style="list-style-type: none"> <li>• CO1: Find the Lévesque measure of measurable sets.</li> </ul>	PSO2,5	KN,CN
				<ul style="list-style-type: none"> <li>• CO2: Discuss the integration of non-negative functions.</li> </ul>	PSO2,5	KN,CN,AN
				<ul style="list-style-type: none"> <li>• CO3: Analyze abstract measure spaces.</li> </ul>	PSO2,4,5	CN,AN
				<ul style="list-style-type: none"> <li>• CO4: Demonstrate Hahn decomposition theorem and signed measure.</li> </ul>	PSO2,5	CN,AN
				<ul style="list-style-type: none"> <li>• CO5: Compute product measure.</li> </ul>	PSO2,5	KN,EN
PGMJ	Topology	Local , Regional, National & Global	To get the Knowledge of Analysis in advance	<ul style="list-style-type: none"> <li>• CO1: Analyze the fundamental concepts of general</li> </ul>	PSO1,2	U,KN,AN,AP

				topology.		
				<ul style="list-style-type: none"> <li>• CO2: Determine the types of topological spaces and their properties.</li> </ul>	PSO2	U,KN,AN
				<ul style="list-style-type: none"> <li>• CO3: Discuss Uryzohn's lemma and the Tietze Extension Theorem.</li> </ul>	PSO1,2,4	U,KN,AN,AP
				<ul style="list-style-type: none"> <li>• CO4: Demonstrate Tychonoff theorem</li> </ul>	PSO2,4	U,AN,AP,KN
				<ul style="list-style-type: none"> <li>• CO5: Compute the complete and compactness in metric spaces.</li> </ul>	PSO 2,4	U,AN,AP,KN,E
PGMK	Integral Equations and Transforms	Local , Regional,	To get the knowledge about	<ul style="list-style-type: none"> <li>• CO1:Solve the linear integral equations.</li> </ul>	PSO1	E,AP

		National & Global	Mathematical methods to solve problems.	<ul style="list-style-type: none"> <li>CO2: Find the solutions of Volterra and Fredholm integral equations.</li> </ul>	PSO1,2	C,E
				<ul style="list-style-type: none"> <li>CO3: Demonstrate the variational problems on moving boundaries and fixed boundaries.</li> </ul>	PSO3	KN,C
				<ul style="list-style-type: none"> <li>CO4: Evaluate the Fourier transform, finite sine and cosine transforms.</li> </ul>	PSO1,2,3	U,KN,AP
				<ul style="list-style-type: none"> <li>CO5: Apply Fourier transform in initial and boundary value problems.</li> </ul>	PSO1,2,3	U,KN,AP
PGME3	Mathematical Modeling	Local, Regional,	To study the mathematical models and apply them in real life problems	<ul style="list-style-type: none"> <li>CO1: Create models on linear growth</li> </ul>	PSO1,2,3,4	U,KN,AP

		National & Global		and decay of any system.		
				<ul style="list-style-type: none"> <li>• CO2:Form mathematical modeling in epidemics in population.</li> </ul>	PSO3,4	U,KN,E
				<ul style="list-style-type: none"> <li>• CO3:Design mathematical modelling in any type of motions.</li> </ul>	PSO1,3,4	U,KN,C,AN
				<ul style="list-style-type: none"> <li>• CO4:Solve problems in dynamics and genetics using modeling.</li> </ul>	PSO2,3	U,E
				<ul style="list-style-type: none"> <li>• CO5: Demonstrate various real life situations through graphs.</li> </ul>	PSO1,3,4,5	U,CN,KN
PGME4	Optimization Techniques	Local , Regional, National & Global	Recent development and its	<ul style="list-style-type: none"> <li>• CO1: Write the algorithms in</li> </ul>		

			Applications in research.	integer programming problem.	PSO1,3	KN,C
				<ul style="list-style-type: none"> <li>• CO2: Apply the OR techniques in various models.</li> </ul>	PSO1,4	CN,E
				<ul style="list-style-type: none"> <li>• CO3: Analyze the problems on decision theory and game theory.</li> </ul>	PSO3,4	CN,AN
				<ul style="list-style-type: none"> <li>• CO4: Optimize solutions of inventory models.</li> </ul>	PSO3,4	EN,AN,AP
				<ul style="list-style-type: none"> <li>• CO5: Interpret the concepts of non-linear programming problems.</li> </ul>	PSO2	AN,AP
PGML	Functional Analysis	Local , Regional, National & Global	To get the knowledge of Analysis in advance.	<ul style="list-style-type: none"> <li>• CO1: Disuss the concept of normed linear spaces, dual</li> </ul>	PSO2,4	U,KN,AN

				spaces, weak convergence.		
				<ul style="list-style-type: none"> <li>• CO2: Apply the idea of the Hahn Banach theorem and open mapping theorem.</li> </ul>	PSO2,3,4	U,KN,AN,E
				<ul style="list-style-type: none"> <li>• CO3: Analyze linear operators on Hilbert space.</li> </ul>	PSO2,3,4,5	U,KN,AN
				<ul style="list-style-type: none"> <li>• CO4: Evaluate orthonormal basis.</li> </ul>	PSO2,4	E,AN
				<ul style="list-style-type: none"> <li>• CO5: Demonstrate the commutative Banach algebras.</li> </ul>	PSO 1,2,3	U,AN,C
PGMM	Probability Theory	Local , Regional, National & Global	Advancement of the application of fluid dynamics	<ul style="list-style-type: none"> <li>• CO1: Interpret the field and <math>\sigma</math> - fields</li> </ul>	PSO1,3	U,CN
				<ul style="list-style-type: none"> <li>• CO2: Analyze the</li> </ul>		



				probability spaces.	PSO3	CN,AN
				<ul style="list-style-type: none"> <li>• CO3: Apply the concepts of random variables and distributions.</li> </ul>	PSO2	U,KN,CN
				<ul style="list-style-type: none"> <li>• CO4: Describe the ideas of expectation and characteristic functions.</li> </ul>	PSO4	U,KN,CN
				<ul style="list-style-type: none"> <li>• CO5: Demonstrate the convergence of random variables.</li> </ul>	PSO1,2,3	KN,CN
PGMN	Fluid Dynamics	Local , Regional, National & Global	Advancement of the application of fluid dynamics	<ul style="list-style-type: none"> <li>• CO1:Discuss the behavior of fluids in motion.</li> </ul>	PSO1,2	U,C,AN
				<ul style="list-style-type: none"> <li>• CO2: Demonstrate the changes in flow when sphere of cylinder is introduced.</li> </ul>	PSO1,2,3	CN,AN
				<ul style="list-style-type: none"> <li>• CO3: Estimate the applications of two dimensional flow.</li> </ul>	PSO3,4	CN,EN

				<ul style="list-style-type: none"> <li>• CO4:Apply the stress components on viscous flow.</li> </ul>	PSO3,4	CN, E
				<ul style="list-style-type: none"> <li>• CO5:Solve problems in viscous flow and describe the energy dissipation.</li> </ul>	PSO 2,4	EN,AP
PGME5	Differential Geometry and Tensors	Local , Regional, National & Global	To apply the notion of geodesics on surfaces and their properties	<ul style="list-style-type: none"> <li>• CO1:Discuss the concept of graphs and level sets-vector fields.</li> </ul>	PSO1,2	U,KN,AN
				<ul style="list-style-type: none"> <li>• CO2:Analyze surfaces and vector field on surfaces.</li> </ul>	PSO 2	U,KN,AN
				<ul style="list-style-type: none"> <li>• CO3:Apply the properties of geodesics.</li> </ul>	PSO1,2	U.KN,AN
				<ul style="list-style-type: none"> <li>• CO4:Interpret the scope of developable,</li> </ul>	PSO1,2	U,KN,E

				minimal and ruled surfaces.		
				<ul style="list-style-type: none"><li>• CO5: Compute the compactness and completeness of surfaces.</li></ul>	PSO1,,2,5	U,KN,AN